Sports management/Building automation

Customer case study

Teamwork modernizes the Schüco Arena in Bielefeld, Germany

Increased efficiency in play: New building management system for the Arminia Bielefeld stadium

Highlights

- The Schüco Arena dates to 1926, and stadium management wanted to equip the soccer stadium with modern technology
- The arena operators have three goals in the long-term upgrade: increased convenience, increased options, and increased efficiency
- Emalytics building management software from Phoenix Contact gives the facility managers a real-time look at operational data so they can meet these three goals

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>
> – CHRISTIAN VENGHAUS

Customer profile

Soccer connects people. And there is a strong connection between Arminia Bielefeld, a soccer team playing in Germany's top division, and Phoenix Contact. The shared goal of this technological partnership is to completely modernize the outdated Schüco Arena (pictured above).

Figure 1: The switching devices were modernized in the first step.

The Arminians have an optimistic spirit and want to operate the traditional stadium – the first game was held here on May 1, 1926 – in downtown Bielefeld in a noticeably more sustainable way. Sustainability is also one of the major priorities for the future of the German Soccer League. The league even considers sustainability initiatives as a factor when clubs in the first to third divisions of the league apply for licenses (figure 1).

Challenge: Making data useful

This task has the status of a Phoenix Contact lighthouse project. One of the challenges faced is how to equip the existing soccer stadium with the latest technology while match operations continue. So far, the switching devices in the dressing rooms area have been renovated, and building automation has been integrated into other areas of the stadium. This work has laid the foundation for new structures and control options.

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Increased convenience, increased options, and increased efficiency – these are the three main goals of digitalizing existing buildings. Making a soccer stadium such as the Schüco Arena more intelligent is not the only objective. Rather, by collecting comprehensive operating data, the stadium managers are setting up the possibility of making this data usable in the future. Team members can then improve operating processes and control them better based on specific needs – ranging from the connection of booking systems and game schedules to weather data.

Solution: IoT-based building management

In one of the first projects, members of the Phoenix Contact project team installed a new control cabinet in the dressing room area. The building automation solution integrated into this will make it possible to control room temperatures precisely in the future and to make sure they remain energy-optimized.

"We have to ensure a certain temperature level to prevent the players from catching a cold in winter," explains project and solution developer Daniel Kloster from Phoenix Contact. The automation of the heating and ventilation technology is combined with controllable pumps, which supply the dressing rooms with sufficient hot water from the heating area. Here, the system will deliver only as much hot water as needed at any particular time.

"This ensures that the heating supply system does not overheat in either the feed or return direction. The needs-based control of pump output, therefore, helps to save energy," summarizes Frederik Busse, project manager at Phoenix Contact. Such control options are only available, however, because the pumps are linked to the building automation system via Ethernet protocol. The core element is the IoT-based Emalytics building management system (BMS) from Phoenix Contact with the open ILC 2050 BI controller (figure 2).

Figure 2: Pumps are controlled using the open ILC 2050 BI building controller.

Harmonizing multiple functions

Emalytics offers much more than what people understand as classic building automation or a comprehensive BMS. Phoenix Contact has developed a solution that combines building automation, power generation, electromobility, and room booking. By using Emalytics, the operators will be able to control the Schüco Arena holistically in the future, so that interactions will be recognized and operations can be made more efficient. The system's openness makes it possible to integrate additional functions, such as charging station management for electric vehicles and the automated assignment of consumption data to the individual catering stands later.

One of the tasks for Emalytics lies in harmonizing all functions of a building beyond the HVAC area (heating, ventilation, and air conditioning) in terms of data technology. To do this, the available data must be brought into a standardized format. The BMS does not string together any hardware interfaces to do this. Instead, it uses software-based function drivers. This means that the system requires less space in the control cabinet. It also reduces wiring efforts, which makes modernizing the building inventory significantly easier.

"In view of the demanding goals many operators set, one of our services is to provide customers with advice on such a large project at an early stage," explains Daniel Kloster.

Results: Calculating consumption data precisely

A smart building automation system without limitations on later use: New opportunities are opening up for Arminia Bielefeld to operate the Schüco Arena profitably in areas outside of sports. For example, in a second subproject, Phoenix Contact has modernized the "Penalty Area." This is not an additional penalty area on the playing field. Rather, it is a multifunctional room with a good view of the playing area. Outside of soccer operations, companies or private groups can rent the Penalty Area for events.

Modernizing requires a control intelligence that collects system data, such as water and electricity consumption, and transforms it into actionable information. The arena managers can then provide the appropriate convenience levels for room conditions and, just as important, can bill ancillary costs precisely. "The collection of energy measurement data via EMpro devices is essential," emphasizes Daniel Kloster. This benefits both the users of the Schüco Arena and the company's own building technicians from facility management. By integrating the individual areas into the Emalytics BMS, the technicians can reduce their daily workload. The monitoring gives them more data transparency. For example,

nobody has to check on-site whether the lights in the dressing rooms and in the penalty area have actually been switched off (figure 3).

Figure 3: The measuring devices of the EMpro product family capture all energy data.

Browser-based monitoring via smart device

In the current progression of the project, central access to the building technology with a standardized visualization system in Emalytics can also be described as foundation work. "Now we can control and monitor the air conditioning and lighting integrated into the management system from anywhere via a browser using smart devices," says Christian Venghaus happily. "During a game or other events, our team has everything in view and can respond even to minor anomalies without having to walk through the entire stadium first," continues the head of stadium operations (figure 4).

Ambitious projects such as modernizing older soccer stadiums can only be realized with close engineering cooperation. What matters on the playing field also applies to large-scale retrofits:

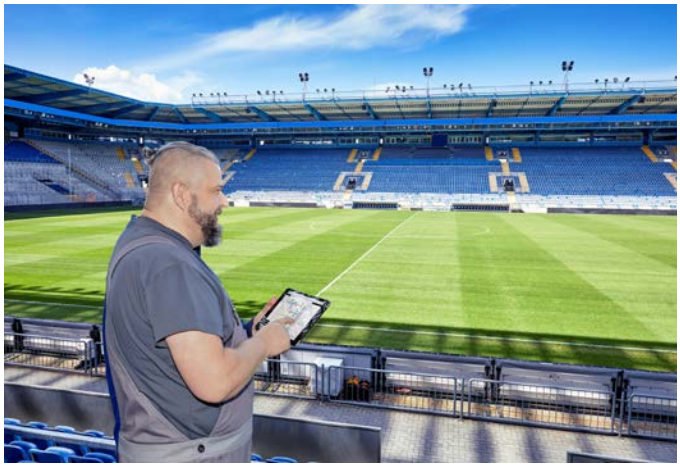

Figure 4: The technical building data can be displayed anywhere on smart devices.

cooperation and teamwork are necessary.

"All members of the team contribute here," says project manager Frederik Busse from Phoenix Contact. His colleague Daniel Kloster also finds it remarkable just "how much fun the project staff at Arminia Bielefeld are having with the modern building technology."

Figure 5: The project management team from Arminia Bielefeld, Christian Venghaus, Maik Lohmeyer, and Daniel Müller (from left), are impressed with the new building technology.

The modernization is scheduled to take around four years. Kickoff began with the first project at the control-cabinet level. Currently, the sensor technology for consumption measuring in the Schüco Arena is being installed.

"These devices will provide us with the information we need to make further improvements in efficiency and to bill users outside of the Arminia environment based on consumption," concludes Christian Venghaus (figure 5).

Conclusion

These measures are the first steps along the modernization road toward a smart stadium with a lot of tradition. All of this work will save resources and help the arena operate more profitably. A project like this requires open systems and professional cooperation. Ultimately, what counts is similar to what happens on the field: the team will succeed by working together.

Sustainability as a corporate purpose

"Sustainability and climate change are the global challenges of our time. Phoenix Contact wants to do its part with innovations and technological solutions that help to shape a future worth living," says Frank Stührenberg, CEO of Phoenix Contact. Sustainability is core to everything that Phoenix Contact does. The need to preserve resources, protect the environment, and reduce our impact on the climate is kept in mind when developing new products, when manufacturing, and when considering costs. The same applies for the Arminia Bielefeld Sports Club. Using the IoT-based Emalytics BMS improves energy efficiency and saves resources.

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